Please delete the heading "Abstract" at page 14, and in its place insert the following centered heading:

IN THE ABSTRACT

Please replace the remainder of the Abstract page to read as follows:

-- Abstract Of The Disclosure

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X-ray examination apparatus with x-ray image sensor matrix and correction unit. The x-ray examination apparatus includes an x-ray image sensor matrix [(1)] for deriving an initial image signal from the x-ray image. The sensor elements of the x-ray sensor matrix convert incident x-rays into electric charges. These electric charges are read-out and converted into the initial image signal. A correction unit is provided for correcting the initial image signal, notably for disturbances due to delayed transferred charges, that have been retained in the sensor elements for some time. The correction unit s provided with a memory which stores correction values. Further the correction unit is provided with a selection unit or selecting appropriate correction values from the memory. --.

REMARKS

This writing is submitted in response to the Office Action mailed dated July 2, 2001. Claims 1, 2, 4, and 5 are amended

hereby; claim 3 is deleted; newly presented claims 6-8 are added. Hence, claims 1, 2 and 4-8 are pending hereinafter, where claims 1 and 8 are the independent claims. Reconsideration is respectfully requested.

Response To Rejections Under 35 U.S.C. § 102

The Examiner has rejected claims 1-3 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 5,974,113 to Bruijns et al. (hereinafter "Bruijns"), asserting that Bruijns teaches an x-ray imaging system with a source 21, image intensifier 24, sensor arrays 2,3, arithmetic unit 10 for calculating image correction values, a memory 41 for storing precalculated correction values, an image processor 7,8 to calculate a corrected image from a current image and correction values including dark current correction and display 35.

In response, applicants respectfully assert that claims 1 and 2 (claim 3 is deleted), and newly presented claims 6-8 are not anticipated by Bruijns for at least the following reasons.

Bruijns discloses an x-ray examination apparatus with an x-ray source to form an x-ray image of an object, an x-ray detector for deriving an optical image from the x-ray image, an image pick-up apparatus including one or more image sensors for deriving sub-image signals of the optical image, and a combination unit for combining the sub-image signals to form a composite image. The apparatus includes a correction unit to correct for variations of brightness values of the sub-images with respect to offset and gain differences inadvertently

generated by the different image sensors, and the disturbances which are a consequence of said differences, e.g., a streaky pattern.

Claim 1 is not anticipated by Bruijns since Bruijns' correction unit does not disclose (or suggest) applicants' x-ray image sensor matrix for deriving a calibration image signal from a predetermined calibrated x-ray exposure, and an initial image signal from an x-ray image. Nor does Bruijns disclose applicants' correction unit for deriving a corrected image signal from the initial image signal, wherein the correction unit includes a memory for storing correction values derived from the calibration image signal and an arithmetic unit for computing signal levels of the corrected image signal from signal levels of the initial image signal and at least some of said correction values.

As distinguished from Bruijns, applicants' correction unit has an ability to correct the ill effects of delayed emissions based on correction values obtained from **a separate calibration of the examination process**. Applicants' correction unit is designed to correct for the delayed emission of electric charges trapped in the semiconductor material comprising the matrix from an **earlier X-ray exposure** (not through the use of sub-image signals as taught by Bruijns). The delayed electric charges are responsible for after-images which would normally be displayed with the instant image thereby corrupting the instant image.

By use of at least one correction value derived from electric charges emitted during read-out after one or more

periods of time since a pre-selected number of x-ray pulses with pre-selected pulse-length, pulse rate and x-ray dose per pulse irradiate its single x-ray sensor image matrix, the claimed inventions use the at least one correction value to correct the instant image signal.

Bruijins' correction unit does not address imaging problems resulting from after image signals arising from trapped charge carriers, and the effect of such after images on instant images.

More particularly, Bruijins makes corrections on the basis of dark current values stored in memory units, the known corrections are unable to take delayed charges into its calculations. Bruijins does not include an x-ray image sensor matrix for deriving a calibration image signal from a predetermined calibrated x-ray exposure, and an initial image signal from an x-ray image, and a correction unit for deriving a corrected image signal from the initial image signal, wherein the correction unit includes a memory for storing correction values derived from the calibration image signal and an arithmetic unit for computing signal levels of the corrected image signal from signal levels of the initial image signal and at least some of said correction value, as set forth in applicants' claim 1.

More particularly, applicants' claim 1 correction unit and correction values are patentably distinct from Bruijins (page 3, lines 5-7) because of the benefit of performing the correction operation in an amount of time which is less than the time it would take Bruijins to perform same.

Moreover, method claim 8 sets forth a method of performing an x-ray examination of an object where the resulting image signal presented for viewing is corrected utilizing the utilizing the structure of the novel x-ray examination apparatus as disclosed.

Consequently, claims 1, 2 and 4-8 are not anticipated by Bruijns, and applicants respectfully request that the rejections to those claims under 35 U.S.C. § 102(e) be withdrawn.

Response to Rejections Under 35 U.S.C. § 103

Claims 4 and 5 were rejected in the Office Action under 35 U.S.C. § 103(a) as obvious in view of Bruijns. In particular, the Examiner asserts that Bruijns fails to mention interpolating correction values from stored values, but that it would have been obvious that the arithmetic unit 10 could interpolate as well as calculate values, rendering claims 4 and 5 obvious.

In response, applicants respectfully traverse these rejections because Bruijns is not proper prior art to claims 4 and 5 under 35 U.S.C. § 103(c). Section 103(c ) states that:

**subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time of the invention was made, owned by the same person or subject to an obligation of assignment to the same person.**

While Bruijins has a Section 102(e) filing date of June 14, 1996, the instant application has a foreign application priority date of December 23, 1996. Because Bruijins is Section 102(e) art (not Section 102 (a) or 102(b) art), Bruijins falls under the Section 103(c) exclusion.

Both the Bruijins patent and the present application are owned by U.S. Philips Corporation, "the same person" under Section 103(c).

Consequently, applicants respectfully assert that claims 4, 5 and new claims 6-8 are not obvious under Section 103(a) in view of Bruijins therefore, and request withdrawal of the claim rejections thereunder.

Response To Rejection Under Obviousness-Type Double Patenting

Claims 1-5 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over US Patent No. 6,246,746, commonly owned by the owner of the present application.

The Examiner claims 1-5 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of commonly owned US Patent No. 6,246,746 ("the '746 patent"), filed August 19, 1998 and accorded serial no. 09/125,482. The application, 09/125,482, evolved is the parent of the instant application. The rejected claims of the instant application have been substantially amended hereby, and claim 3, corresponding to claim 1 of the '746 patent has been deleted. Applicants

respectfully assert, therefore, that instant claims 1, 2, 4 and 5, and new claims 6-8, are patentably distinct from claims 1-3 of the '746 patent, and the rejection is traversed.

If the rejection is maintained, however, applicants note that the Examiner has indicated that a terminal disclaimer may be used to overcome this rejection. In accordance with the Examiner's suggestion, and upon indication that the present application is allowable, if the obviousness-type double patenting rejection is maintained, a terminal disclaimer will be submitted to overcome the rejection.

Applicants respectfully request entry of the foregoing amendments and remarks into the file of the above-captioned application. Applicants believe that each ground for rejection or objection has been successfully overcome or obviated and that all the pending claims, that is, claims 1, 2 and 4-8, are in condition for allowance. Reconsideration and withdrawal of the Examiner's rejections and allowance of the application is earnestly requested.

Any fee necessary is believed to be paid by the authorization contained in the transmittal letter filed concurrently herewith and in the already-filed Charge Authorization Pursuant to 37 CFR § 1.136(a)(3); please charge any fee deemed necessary, including any fees for response time extensions, except the issue fee, or credit any overpayment to deposit account no. 14-1270.

If any outstanding issues remain, the Examiner is invited by the undersigned to discuss the same and to arrange for prompt and efficient handling of the above-captioned application.

Respectfully submitted,

By: _____
John F. Vodopia, Reg. 36,299
Attorney for Applicants
(914) 333-9627

CERTIFICATE OF MAILING

It is hereby certified that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to:

COMMISSIONER FOR PATENTS
Washington, D.C. 20231

On October 2, 2001

By _____

The amendments to the Specification are as follows:

IN THE SPECIFICATION

Cross Reference To Related Applications

This is a [X] continuation [ ] divisional of application Serial No. 09/125,482 [09/125,483], filed August 19, 1998, and issued as US Patent No. 6,246,746 on June 12, 2001, commonly owned.

Page 1, before line 1, insert the following centered heading:

--BACKGROUND OF THE INVENTION--;

after the heading, insert at the left margin:

--1. Field of the Invention--;

before line 7, insert at the left margin;

--2. Description of Related Art--;

Page 2, before line 21, insert the following centered heading:

--SUMMARY OF THE INVENTION--;

At page 3, please replace the last paragraph to read as follows:

The physical process of trapping and releasing of electric charges in the x-ray image sensor matrix is represented by a mathematical model containing a small number

of model parameters [modelparameters]. This mathematical model has been disclosed in more detail in the article Measurements and simulation of the dynamic performance of an ▒-Si:H image sensors = in the Journal of Non-crystalline solids Vol.164-166(1993)781-784. Values for the model parameters [modelparameters] are derived from the calibration image signal, in particular by performing a best fit to the mathematical model. On the basis of the values of the model parameters [modelparameters] there are computed correction values which represent delayed electric charges for separate x-ray exposure circumstances and for arbitrary periods of time lapsed since the latest x-ray exposure. This computation of the correction values can be performed separately from the x-ray examination apparatus, but the arithmetic unit of the x-ray examination apparatus itself can also be used. Sets of correction values are stored which relate to various x-ray exposure circumstances. In particular, sets of correction values are stored for separate values of the number of preceding x-ray pulses, the x-ray pulse rate, respective intensities of the preceding x-ray pulses. Each set includes correction values for several values of the time lapsed since the latest x-ray pulse.

Please amend the last paragraph of page 4 to read as follows.

The arithmetic unit computes the signal levels of the corrected image signal from the signal levels of the initial image signal and the correction values. Only relatively simple

computations are required such as subtracting the correction values from the signal levels of the initial image signal. Because the computations involving the mathematical model of the trapping and release of charges need only to be carried-out once for the calibration image signal, for correcting the initial image signal only simple calculations are required. The simplicity of the required calculations is achieved at the cost of storing a number of correction values which is substantially larger than the small number of model parameters [modelparameters].

Please amend the second paragraph on page 8 to read as follows.

Interpolation is a simple, rapid and accurate method to derive a correction value from stored correction values. Thus, only correction values for a relatively small number of values for the model parameters [modelparameters] need to be stored. Correction values relating to values of model parameters [modelparameters] for which no correction values are stored are interpolated from correction values relating to values of model parameters [modelparameters] which are close to the values at issue. Further, correction values relating to an arbitrary time lapsed since the latest x-ray exposure can be calculated from stored correction values for particular values for said lapsed time. Preferably a bisection method is employed for rapidly finding correction values which are employed for the interpolation.

Page 8, before line 22, insert the following centered heading:

--BRIEF DESCRIPTION OF THE DRAWING--;

Page 8, before line 25, insert the following centered heading:

--DESCRIPTION OF THE PREFERRED EMBODIMENT--;

Page 11, please replace the first full paragraph to read as follows:

Further, the control unit 6 is arranged to switch the x-ray image sensor matrix 1 with the correction unit between an imaging mode and a calibration mode. In the calibration mode a predetermined series of calibration x-ray exposures is carried-out from which the relevant values of the model parameters [modelparameters] are derived by the arithmetic unit 4. The arithmetic unit 4 subsequently derives the correction values based on the mathematical model.

and, after the last line, please add the following new paragraph:

--All references cited herein are incorporated herein by reference in their entirety and for all purposes to the same extent as if each individual publication or patent or patent application was specifically and individually indicated to be incorporated by reference in its entirety for all purposes.--.

Please delete the heading "Claims" at page 12, and in its place insert the following centered heading:

IN THE CLAIMS

Please delete claim 3 without prejudice of subject matter, amend claims 1, 2, 4 and 5 to read as set forth, and add new claims 6-8 as set forth.

1. (Amended) An x-ray examination apparatus comprising

[-] an x-ray image sensor matrix [(1)] for deriving an initial image signal from a predetermined calibrated [an] x-ray exposure, and an initial image signal from an x-ray image, and

[-] a correction unit [(2)] for deriving a corrected image signal from the initial image signal, wherein [characterized in that -] the correction unit [(2)] includes a [-] memory [(3)] for storing correction values derived from the calibration image signal and [-] an arithmetic unit [(4)] for computing signal levels of the corrected image signal from signal levels of the initial image signal and at least some of said correction values in order to take delayed charges into consideration during correction.

2. (Amended) An x-ray examination apparatus as claimed in Claim [-] 1, wherein [characterized in that] the correction unit [(2)] includes a selection unit [(5)] for selecting correction values from the memory [(3)] on the basis of exposure parameters.

4. (Amended) An x-ray examination apparatus as claimed in Claim 1, [any one of the preceding Claims characterized in that -] wherein the arithmetic unit [(4)] is arranged to compute accurate correction values, from the stored correction values derived from the calibration image signal, and [in - that the arithmetic unit (4) is arranged for computing] to compute signal levels of the corrected image signal from signal levels of the initial image signal and said accurate correction values.

5. (Amended) An x-ray examination apparatus as claimed in Claim [-] 4, wherein [characterized in that] the arithmetic unit [(4)] is arranged to interpolate said computed correction values between stored correction values.

6. (New) The x-ray examination apparatus as claimed in claim 1, wherein the arithmetic unit is arranged to compute accurate correction values from stored correction values, and to compute signal levels of the corrected image signal from signal levels of the initial image signal and said accurate correction values.

7. (New) The x-ray examination apparatus as claimed in claim 6, wherein the arithmetic unit is arranged to interpolate said computed correction values between stored correction values.

8. (New) A method for performing an x-ray examination utilizing an x-ray examination apparatus having an x-ray image sensor matrix and an x-ray image correction unit with a memory and arithmetic correction unit wherein a resulting corrected image signal presented for viewing is substantially free of after images from previously generated x-ray image signals, the method comprising the steps of:

deriving a calibrated image signal by irradiating the image sensor matrix with a predetermined calibrated x-ray exposure;

generating correction values from the calibrated image signal;

storing the correction values in a memory;

radiating an object for examination and deriving an instant image signal from the image sensor matrix pursuant to said radiating; and

correcting the instant image signal to form the corrected image signal by processing the instant image signal in the x-ray image correction unit in accordance with at least one of said memory-stored correction values in order to take delayed charges into consideration during correction.

Please delete the heading "Abstract" at page 14, and in its place insert the following centered heading:

IN THE ABSTRACT

Please replace the remainder of the Abstract page to read as follows:

Abstract Of The Disclosure [Abstract]

X-ray examination apparatus with x-ray image sensor matrix and correction unit. The [An] x-ray examination apparatus includes [comprises] an x-ray image sensor matrix [(1)] for deriving an initial image signal from the x-ray image. The sensor elements of the x-ray sensor matrix convert incident x-rays into electric charges. These electric charges are read-out and converted into the initial image signal. A [Further a] correction unit [(2)] is provided for correcting the initial image signal, notably for disturbances due to delayed transferred charges, that have been retained in the sensor elements for some time. The correction unit [(2)] is provided with a memory which stores correction values. Further the correction unit is provided with a selection unit [(5)] for selecting appropriate correction values from the memory [(3)].

[Figure 1]